

LAWRENCE LIVERMORE REPORT

A weekly collection of scientific and technological achievements from Lawrence Livermore National Laboratory: April 21-25, 2008.

Laser experiments reveal mysteries of gas planets



Shown is a time-integrated photo of one of the Omega laser experiments where the research team discovered ultra-high compressibility of helium at the metal insulator transition.

By shooting the high-energy Omega laser onto precompressed samples of planetary fluids, Lawrence Livermore scientists are gaining a better understanding of the evolution and internal structure of Jupiter, Saturn and extrasolar giant planets.

In a report that appears in *Physical Review Letters*, Laboratory scientists, collaborating with researchers at the Laboratory for Laser Energetics, CEA France and UC Berkeley, reveal how they were able to determine the equation of state (EOS) for fluid He at pressures above 100 gigapascals.

For more see, https://newsline.llnl.gov/articles/2008/apr/04.25.08_helium.php

From brilliant beams, fusion energy grows



The FODI system is the cornerstore of optic recycling at the National Ignition Facility.

What do you do with the world's biggest, highest-intensity laser system? Popular Mechanics explored that question in a recent article on Lawrence Livermore's National Ignition Facility, or NIF.

As the magazine reports, NIF, when completed, will blast the nuclei of hydrogen atoms and transform their mass into energy in a reaction that rivals the force and temperature of an exploding nuclear warhead. NIF also will be used for research in fusion energy, astrophysics and basic science.

For more see, http://www.popularmechanics.com/blogs/science_news/4259187.html

Celebrating Edward Teller's scientific legacy



As part of his centennial observance, Lawrence Livermore National Laboratory is hosting a full-day symposium on the scientific legacy of the late Dr. Edward Teller. The event will take place on May 28 at the new Bankhead Theatre in downtown Livermore, Calif. The format will consist of presentations and historical reflections on Teller's scientific career, followed by specialized lectures from distinguished speakers in each field of science, technology and education where he made seminal contributions.

The symposium is sponsored by the Lawrence Livermore National Laboratory, the University of California, the Hertz Foundation, and the Hoover Institution of Stanford University.

For more information, see <https://tellercentennial.llnl.gov/>

USCAR gets a look at Lab's work in energy research



Members of the U.S. Council for Automotive Research check out the Lab's hydrogen car.

The United States Council for Automotive Research visited Lawrence Livermore this week for briefings on the Lab's work in global security, hydrogen production, alternative fuels, internal combustion engines, combustion chemistry and cryogenic pressure vessels.

Representatives from the Big Three automakers, along with the Department of Energy, came to the Lab to look for cooperative research and development opportunities to further strengthen the technology bases of the U.S. auto industry.

LLNL submits ‘hottest’ paper for ‘Water Resources’



A LLNL paper is currently listed as the “hottest” paper for the fourth quarter of 2007 in the journal *Advances in Water Resources*. The paper, titled "The Groundwater-Land-Surface-Atmosphere Connection: Soil Moisture Effects on the Atmospheric Boundary Layer in Fully Coupled Simulations," was authored by researchers Reed Maxwell, a hydrological modeler; Tina Chow, a former post-doc and now a UC Berkeley assistant professor and Stefan Kollet, a former researcher now at the University of Bonn’s Meteorological Institute.

To access the paper, see the [Web](#).

LLNL is managed by Lawrence Livermore National Security, LLC, for the U.S. Department of Energy's National Nuclear Security Administration.

LLNL applies and advances science and technology to help ensure national security and global stability. Through multi-disciplinary research and development, with particular expertise in high-energy-density physics, laser science, high-performance computing and science/engineering at the nanometer/subpicosecond scale, LLNL innovations improve security, meet energy and environmental needs and strengthen U.S. economic competitiveness. The Laboratory also partners with other research institutions, universities and industry to bring the full weight of the nation's science and technology community to bear on solving problems of national importance.

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